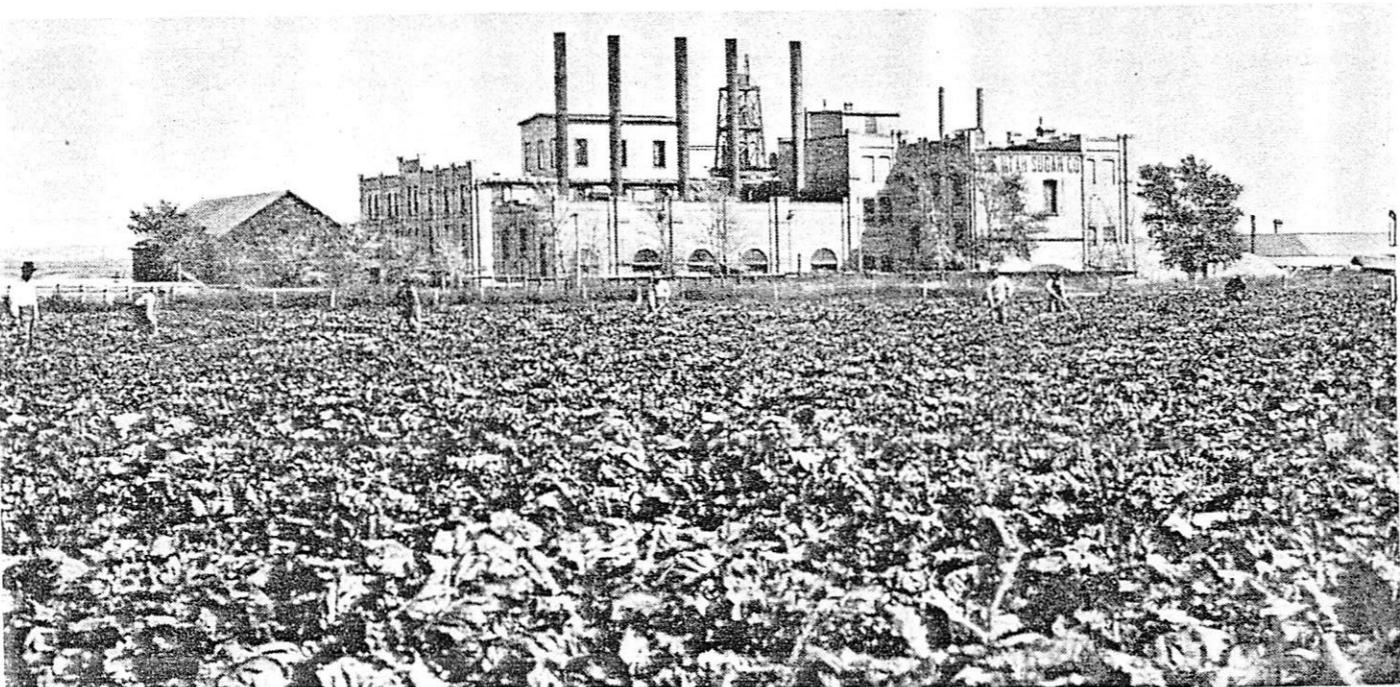


Sugar Beet Raising

The Lehi Beet Sugar Factory

IMPROVED AGRICULTURAL PRACTICES AND MANUFACTURING INNOVATIONS GAVE THE LEHI FACTORY A LEADING ROLE IN SUGAR PRODUCTION.



Utah Sugar Company plant at Lehi, built in 1891, with fields of sugar beets in foreground. Photograph courtesy of the author and Utah-Idaho Sugar Company.

BY LEONARD J. ARRINGTON

The Lehi factory of the Utah Sugar Company was the first beet sugar factory in the Mountain West, the first to use beets grown by irrigation, the first to have a systematic program for producing its own beet seed, the first to use American-made machinery, the first to use the "osmose process" of reprocessing molasses, and the first to build auxiliary cutting stations. This factory also served as a training base for many of the technical leaders of the sugar beet industry of the United States.

Stayner's efforts finally won the support of church and business leaders to form a company to finance further investigations. On September 4, 1889, the Utah Sugar Company filed incorporation papers in Salt Lake City. After test plantings of sugar beets in different areas of Utah produced beets that seemed to have a high enough sugar content, the company moved ahead with plans to build a factory.

The town of Lehi offered the company a 40-acre building site, perpetual water rights to a nearby stream, and the factory could be built

hours. The facilities also included a boarding-house to accommodate 50 people.

Faced with serious financial problems, factory officials, stockholders, creditors, growers, and others anxiously awaited the opening of the plant. Would it actually produce sugar? In an earlier attempt by the Mormons to make sugar the only product had been a syrup so sharp that "it would take the end of your tongue off." The big moment came on October 15, 1891:

The first strike of sugar was watched with great interest and considerable concern. Such a crowd of citizens were present in the pan room while the boiling was going on that it was difficult to get around....Fred Trane was the "doubting Thomas" who repeatedly stated that he wouldn't be convinced that white sugar could be made from the black syrup until he saw the sugar right in his hand.

It was after midnight when the strike was dropped, but they all waited for that important event. Then everyone rushed to the centrifugal and when the first machine had spun off the molasses, Mr. Dyer could hardly get room enough to perform the washing. However, he soon passed out the clear white sugar, giving each one of his audience some of it "right in his hand." Immediately "hurrahs" and "hosannas" filled the air — even Fred Trane cried out, "I'm now convinced that sugar can be made from beets!"

General manager Thomas R. Cutler telephoned the Salt Lake Herald: "We have just made the first pound of sugar. By morning we will have 20 tons ready." That morning 20,000 pounds of sugar were sacked and sent by Union Pacific Railroad to Salt Lake City. The sugar was transferred to large, low wagons called drays. Led by a yoke of oxen to dramatize the pioneering nature of the enterprise, the procession made its way to leading Salt Lake City retailers under the sign "First Carload of Granulated Sugar Made by the Utah Sugar Company."

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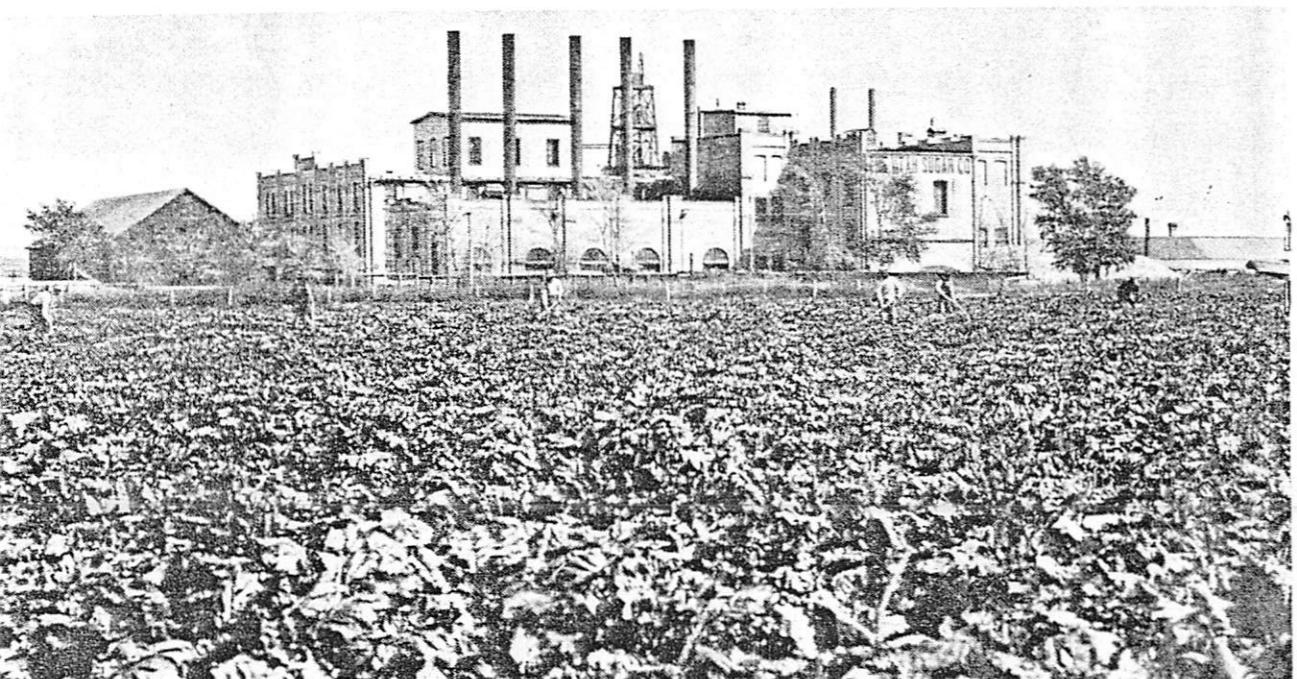
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Arthur Stayner, a Mormon horticulturist from England, received a \$5,000 bounty from

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tical solutions to the many problems involved in growing beets and manufacturing sugar illustrates the innovative contributions of this enterprise.



Sugar beet test field shows sparse crop in center grown from commercial seed. USHS collections.

The only available sugar beet seed in commercial quantities came from France and Germany. These countries tended to keep the best seed for their own use. As a result, much of the seed planted at Lehi during the early years was of inferior quality and fell far below the requisite percentage of sugar content and purity. Company officials spent several weeks in Europe visiting beet seed farms and factories and were able to contract for better seed. However, the uncertain supply, price, and quality led the company to consider growing its own seed.

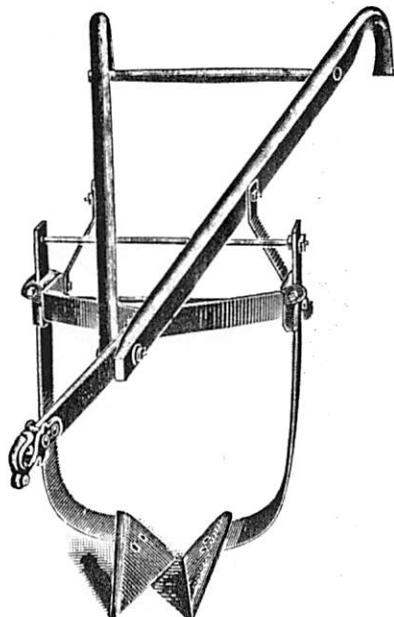
In 1895 Henry Vallez selected the best beet fields in the Lehi area and saw that they were given good care. Thirty tons of the best beets were selected for size, shape, and sugar content. The following spring these "mother beets" were planted by hand in the first attempt to grow beet seed in a semiarid, irrigated region. Although the plants bloomed in profusion, the seed on the outside branches ripened first and had to be cut by hand. When the seed was threshed there was a crop of nine to ten tons of seed showing high germination. When Secretary of Agriculture James Wilson visited the Lehi sugar works in 1897 he "expressed astonishment" at the magni-

Farmers

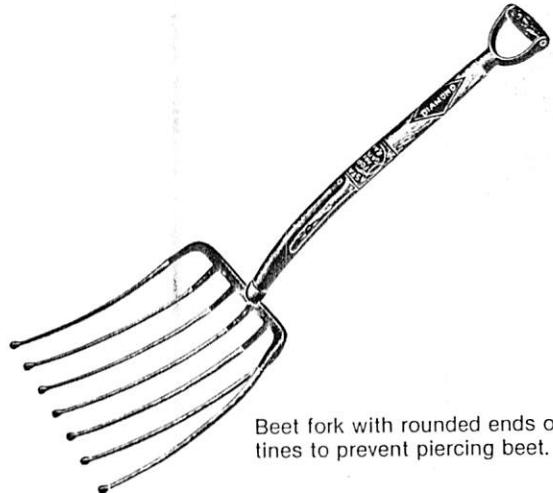
Sugar Beet

germination of beet seed was not high, seed was planted in almost a continuous stream to insure a good stand. With multigerm seed many plants often sprouted from a particular cluster. But beets would not mature if they did not have sufficient room, and so the plants had to be blocked and thinned. When the plants were two or three inches high — about the time school let out in May — brigades of boys from Lehi and other villages would congregate at the meetinghouse at 6 a.m. and ride horses or wagons out to the fields. T. F. Kirkham and Al Yates recalled their experience thinning beets in their early teens.

We aimed to be in the fields to begin work at seven in the morning, took an hour out for noon, and quit at six in the evening. For that day of ten hours we received 50 cents — 5 cents per hour — and were very glad for the job. The beet gang consisted of a group of men and boys. Older boys with long-handled 4-inch hoes would block the beets, that is, chop the compact row of plants into bunches. The younger boys crawled behind on their hands and knees, with a short-handled hoe, thinning each block to a single good plant. To save wear and tear most of the boys wore knee pads — sack-like cushions tied with strings above and below the knee. Every thinner had for his highest ambition the time when he would have a crawler following him on hands and knees. Twenty rows of 40 rods long was a good day's work and parents had no trouble getting boys to bed by suppertime. One person could thin from a fourth to a half of an acre per day.



Horse-drawn beet lifter loosened beets so topers could easily pull them from ground.



Beet fork with rounded ends on tines to prevent piercing beet.

Boys were also used for hoeing out ditches down each row for irrigation and hoeing weeds in midsummer. Many hoeings were regarded as indispensable, and it was not uncommon to hear a farmer urge on the boys by repeating the German admonition, "The sugar must be hoed into the beets."

The beet harvest approached in late September and early October. The original technique of digging was to use a horse-driven sub-soil plow with mold board and share removed. It would dig into the ground and loosen the beets without bruising them. Older boys, let out of school for a two-week "beet vacation," followed the plow with large butcher knives or machetes. Reaching down and grabbing the leaves with one hand, they whacked off the crown of the beet with one blow. The tops would be dropped to the ground to be plowed under or eaten by sheep, and the beet would be tossed into a pile. Others would throw the beets into horse-drawn wagon boxes that were hauled by team to the factory and unloaded by hand. After the first few years local blacksmiths fashioned beet forks for unloading.

The average yield for the 1891 seasons was only 5.3 tons per acre for a cash value of approximately \$24.00 per acre. It was a great disappointment to both farmers and the factory men. Much of the problem lay in the company's insistence on only one or two waterings and its refusal to accept beets that weighed more than three and a half pounds. New contracts issued to farmers omitted some of the ill-advised instructions of the first two years. However, the company would not accept beets under 12 percent sugar and 80 percent purity. With better seed, greater knowledge of beet growing, more care in thinning, more frequent waterings, and better implements for planting, cultivating, and